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An

Inaugural Dissertation

On

Bronchocele

For the degree of Doctor of Medicine

Addressed

To the Medical Faculty

Of the

University of Pennsylvania

By

Conway Rollins Nutt

Of

Virginia

A. D. 1828–9

Passed March 12 1829

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To

Wm Gibson M. D

Professor of Surgery

In the

University of Pennsylvania

Whose literary attainments and extensive knowledge in the various Medical Sciences reflect honour upon the profession, whose private virtues and integrity of character are not less distinguished than his splendid abilities, the following essay is inscribed, as the highest testimony of respect and esteem, by his friend and pupil

Conway Rollins Arett.

Bronchocele

No disease probably in the catalogue of morbid affections possesses such a variety of appellations as the one which is the subject of the present essay. The terms Bronchocele, Gotre or Goitre, Botium, Guttur tumidum, Hernia gutturis, Gongroma &c have all been indiscriminately used to denote a preternatural enlargement or hypertrophia of the thyroid gland. In England the disease is known under the popular name of Derbyshire neck.

History affords ample proofs of the antiquity of this disease and I think there can be little doubt of its coexistence with the aborigines of those countries and provinces in Europe where it is known at the present day. At least analogy would lead us to this induction, for Professor Barton informs us that in his travels among that tribe of Indians settled at Oneida in the state of New York he found Bronchocele

a very common complaint and likewise among the natives living on the banks of the Mohawk river. In the valleys of the Alps, Appennines and Pyrenees Mountains there are many places where scarcely an individual can be found totally exempt from this disease. In the valley of Maurienne, Larrey says that almost all the inhabitants were affected with Goitre of different sizes which rendered them hideous and frightful.* Cretinism or ideotcy is a disease often combined with Goitre. Dr Howard of Baltimore remarks that in his travels through Switzerland he noticed near Sion many cretins who were likewise goitrous. He also adds that as he advanced towards Martigny and St Maurice the number of these persons evidently increased and that the reverse of this was observable in his descent of the Rhone. This mental affection although common in those countries where goitre prevails endemic, is far from being a constant concomitant with

* See Mem. de Chir: Mil. T. 1. p 128

it, for many who are affected with goiterous tumours possess their intellectual faculties in an entire and unimpaired state.* Fodéré asserts that in the year 1800 the villages of St Jean, St Michael, St Maurice and the vicinity of Aiguebelle contained a greater proportion of cretins and goiterous persons than any other part of Switzerland.† Forlephow says the inhabitants of Savoy, Tyrol and Carinthia consider the disease according to its regularity and position a mark of beauty rather than of deformity.‡ In France the disease is principally confined to the districts of Cevennes, Lonnais, Vosges, Rouergue, Doubs and Ardeches. In the mountainous tracts of country throughout Spain, Germany and England Bronchocele is a disease of common occurrence.§§ According to Sir George Staunton goitre prevails to a great extent in Chinese Tartary, where the face of the country resembles that of Switzerland and France. In Bengal Turner asserts that the disease is frequently to be met with and

* Cooper on Goitre vol. 1. p 267
† Traité du Goitre
‡ Mem. sur. Nat. del Gos. p. 22

likewise on the hills of Boutan bordering on Bengal. But why should we any longer pursue our investigations of a disease in foreign and distant countries when it is of so common occurrence in our own? That it is not confined to any particular quarter of the globe is sufficiently evident. In some of the Spanish settlements of South America Goitre prevails to a considerable extent, and in the villages of Jacaltenanga near Jacapula scarcely an inhabitant can be found who has not the disease in an incipient or advanced stage.* Bonpland the companion of the celebrated Humbolt says the disease is endemic in New Grenada and that in the little towns of Hunda and Monpa it is difficult to find a person without it. It is a curious circumstance that those persons who lead a laborious life are rarely subject to the disease.† Near the lakes as Huron, Ontario & among the Indian settlements Bronchocele is frequently to be met with.

* Barton's Mem. on goitre

In Vermont New York Virginia, the Carolinas and Maryland Bronchocele is of common occurence and more particularly so in the two first mentioned states.*

From the general history of the disease which I have attempted to give in the preceeding pages, I think it may be safely affirmed that it is generally, if not always found in valleys surrounded by lofty mountains or hills — where there is an exposure to the south and east winds — where the atmosphere is heavy and humid — where the land is rich and productive.

No age or sex is exempt from this malady. Numerous are the cases on record where new-born infants have had the disease. Females are more subject to it than the males. It is said frequently to be developed in them during the period of Menstruation where not the smallest marks of it were exhibited antecedent to this event.†

* Gibson on Goitre

† Fodéré traité du Goitre

According to Professor Gibson those predisposed to the disease have many of those marks characteristic of the scrofulous diathesis. such for example as light hair, blue and sprightly eyes, a fair skin and florid complexion &c. Bronchocele rarely makes its appearance sooner than the eighth or ninth year. The tumour increases gradually for four or five years and after this its progress is more rapid* Fodéré asserts that in goiterous countries, children are born goiterous after two generations of the intermarriage of goiterous parents. In the third generation the infant is born a cretin. A semi-cretin, weak and sickly marries to a goiterous woman has children born goiterous. This disease is not confined to the human race for many of the lower grades of animals are affected with it.+

The causes of this disease are involved in much obscurity and uncertainty. Hence we find in the writings of almost every author on the subject two theories

* Albers Nos. Nat. Vol. 1. p. 466
+ Barton's Memoir

promulgated and most of them in direct opposition to those of his predecessors. Some asserting that the disease owes its origin to the impregnation of water with earthy matter and in confirmation of this ideal cause assert that Bronchocele has been cured by the use of distilled water. Too many circumstances militate against this theory; besides which daily experience proves its fallacy. Albert says the water in common use by the inhabitants of St. Pierre, St. Sulpice & St. Jean, among whom goitre is very common, holds in solution a much smaller quantity of earthy matter than that of Upper Maurienne where the disease is scarcely ever to be met with. The same circumstance was observed by Bonpland in New-Grenada. In many districts of the United States where the water in common use is impregnated with a variety of earthy matter the disease is never known. It has been said on the other hand that Bronchocele was produced by the use of snow and ice water. But this

is without doubt as fallacious as the other, for in Greenland where snow and ice water is extensively used the disease is never seen and on the contrary in those countries where snow is never seen the complaint is a common one. Low and meagre diet, intemperance, debauchery, the sudden repulsion of cutaneous disorders &c have been supposed to be the agents in producing the disease. These latter may possibly in some instances have acted as exciting causes, but never as predisposing. The weight of authority is I believe in favour of attributing the disease to a peculiar constitution of the atmosphere, and in proof of this, I have advanced some arguments above. The mere removal of a patient from the valley or district within whose limits the disease prevails has had the effect in many instances of entirely eradicating it sans regimen, sans medicine. The same remark is applicable, to a certain extent, to extermin the frequent attendant

on Goitre. "All the cretins that I saw, says Dr Rowe were in adjoining houses, in the little village called La Balia situated in a narrow corner of the valley, the houses being built up under ledges of the rocks, and all of them very filthy very close, very hot and miserable habitations. In the villages situated higher up the mountains no cretins are to be seen, and the mother of one of the children told me of her own accord without my asking the question, that her child was quite a different being when he was up the mountains as she called it, for a few days.* Leake attributes the disease to the severity of the cold damp air, having seen it occur, as he states, generally in the winter, and rarely in the warm dry climates of Italy and Portugal. But the assertion concerning Italy is contradicted by an Italian author, who says the disease frequently occurs in the warmer parts of it: I quote his language "Sui in Napoli, e per tutto il regno, si veggono molti gozzuti, ma non in numero tale, come in Carnia, ed in

* Essay on Cret. Edin. Journal. Vol 5: p 33

Jacobs

Appendix
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pochi altri villaggi."* Professor Gibson has witnessed the fact of persons being cured of Bronchocele by removing from Pittsburg to Philadelphia. along the course of the Connecticut river in the states of New-York, Hampshire and Vermont where Bronchocele was once so prevalent. it has been observed to decline "pari passu" with the progress of cultivation and clearing of the land.+ At Pittsburg in 1798, goitre was so prevalent that out of 1400 inhabitants, 150 persons were affected with it. since that period the disease has become nearly extinct and the natives attribute it to the use of coal fires. all these circumstances tend to corroborate the theory of the disease being of an atmospheric origin, the peculiarities of which remain yet to be devellopped. some have supposed that goitre arose from the same cause which produces intermittent and other fevers, and among the supporters of this doctrine was the late Professor Barton. In opposition to this, it may be alledged that

* Porta Hom. rul. Nat. del Gozz. p. 22
+ Trat. on Bronch. by Professor Gibson. Phil. Jour.

Epidemics prevail in certain districts and places where Goitre is never known and vice versa. Dr Gibson thinks it possible that the cause of the disease may be allied to that of intermittent, but that it is modified by some unknown circumstances and thereby produces a different result.

The proximate cause seems scarcely to have ever arrested the attention of authors on the subject, their investigations having been wholly directed to the discovery of the remote & predisponent. It is the opinion or rather conjecture of Dr Gibson that it is an obstruction of those canals leading from the larynx an trachea to the thyroid gland. Can it be owing to the "mal aria" coming in contact with the gland through these passages, keeping up a constant and morbid irritation and thereby producing inflammation of a chronic character and preternatural enlargements.

The Thyroid Gland is situated on the anterior portion of the neck, being placed upon the

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first and second rings of the trachea and on the sides of the larynx. It consists of two lobes and an isthmus the former of which being flattened and ovoidal extend upwards on the sides of the larynx and downards along the trachea and oesophagus; whilst the latter consisting of a thin narrow slip extends immediately across the upper part of the trachea joining this one lobe to the other. There is also a small pyramidal process arising from the superior and left portion of the isthmus, and running in front of the cricoid and thyroid cartilages is united to the os hyoides by ligamentous fibres. The gland when extended according to Dr Horner measures about three inches from side to side. It is covered in front by the sterno-hyoid and thyroid muscles and laterally by the omo-hyoid and sterno-mastoid. Its lobes rest upon the primitive carotids and the internal jugular veins. It has an investing capsule, but so thin as to render it almost imper-

imperceptible; besides which it is covered by a condensed cellular membrane from the fascia profunda. It is largely supplied with arteries and blood-vessels. It receives two arteries on each side, the one from the laryngeal branch of the external carotid, and the other from the thyroid branch of the subclavian. The gland is of a dark brown colour and has a smooth outer surface. It is composed of small lobules connected to each other by cellular membrane. There is no positive evidence of its possessing an excretory duct, but several small openings have been discovered by Morgagni, Bordeau and others, on the internal surface of the trachea communicating with the gland. Mercurial injections are said to have been forced from these orifices into the cellular structure of the gland. But Dr Gibson who tried the experiment thinks the injection was produced by rupture and not per vias naturales. Fodré inflated the gland through the orifices communicating from it to the larynx. M. Lalouette discovered that

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there was a direct- communication between this gland and those lymphatics situated over the thyroid & cricoid cartilages.* It is said that laborious parturition and lifting heavy weights have suddenly produced a preternatural enlargement of the gland. Hochewelder who saw many cases of Goitre among the American Indians, says, the disease never made its appearance until the females commenced to carry heavy burdens upon their heads.+

Bronchocele is a disease, of not- produced by sporadic causes, of slow and gradual progress and in many cases may exist- a considerable time without- the knowledge of the patient; particularly, if both lobes should be affected at- the same time. Goitre however for the most- part- commences in one lobe first. But- in some instances a uniform enlargement- is observed throughout- the gland. Alibert- says the tumour commences more frequently in the right- than left- lobe, and the same observation has been made by Dr Gibson.

*Haller's Elem. Physiol.

+ Barton's Memoirs

The tumour if not arrested in its progress, goes on enlarging to an enormous extent, weighing in some instances seven or eight pounds & hanging upon the chest so as greatly to impede respiration.* Albert relates the case of a man who had a goiterous tumour which extended to the middle of his chest, and he compares it to a pelican's pouch. "La poche énormé qui s'est formée au dessous de son menton, ressemble a celle de l'oiseau designé communement sous le nom de pelican, et qui figure comme object de curiosité dans les cabinets des naturalistes. Millemann and others have related cases where the tumour extended to the umbilicus and even to the knees. Bronchocele when unassailed by active inflammation is comparatively insensible, soft and doughy to the touch and if it does not impede respiration is rather a source of inconvenience than pain. The diagnosis although apparently easy, the disease being identified by many peculiarities is sometimes obscure and difficult. It may be

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confounded with aneurism of the carotid artery, encysted and sarcomatous tumours, scrofulous enlargements of the lymphatic glands of the neck, morbid dilatation or varicose enlargement of the jugular vein &c. From the first it may be distinguished by the absence of pulsation, by its simultaneous motion with the trachea and larynx when the patient swallows and by its great insensibility. But when the Bronchocele is large and confined to one lobe, of a soft and yielding nature, the artery is often found imbedded in the substance of the gland and therefore the marks are indistinct. This occurrence has been a source of error to some of the most enlightened surgeons. The celebrated case of the Creole negro recorded in the "Dictionnaire des sciences medicales" affords an instance of this kind. A similar case is said to have occurred some years ago in this city, which according to Dr Gibson deceived a great many surgeons. Encysted and sarcomatous tumours have been

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mistaken for Bronchocele, but the history of the case, and its general appearance & the diathesis of the patient, taken tout ensemble are, I believe, the only means of distinguishing the two diseases. An interesting case is recorded by Dr Gibson of an officer who had a tumour of this kind, which had been pronounced by many surgeons to be Bronchocele. The tumour extended from behind the sternum as far up as the thyroid gland. From the history of the case Dr Gibson was induced to puncture the tumour, when a quantity of thick viscid, cheesy and intensely offensive matter was discharged. How the disease had been induced by the long continued use of the leathern stock.* Portaliono and Flajani have related similar cases, but they erroneously conceived them to be a variety of the disease. In the case recorded by Professor Gibson, may it not have been the result of effusion from the inflamed gland, caused by the long con-

* v. Professor Gibson's work on Surg. Pat. Jour.

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continued pressure of the stock? a morbid dilatation of the jugular vein may be distinguished from Bronchocele by its low situation — diminution on pressure and immediate return at its removal — fluctuation and general turgescence along the course of the vein. It has been improperly supposed that Bronchocele & scrofula were the same disease; but this opinion is without foundation. The following are the leading marks of distinction. The Bronchocele is simply a local affection, the constitution remaining unimpaired. Scrofula is without limit in its ruinous effects, pervading the whole system with its ravages. They both occur in most instances in youth, but at different periods. The latter disease often terminates ere spontaneous the patient acquires strength and advances towards the years of puberty, whilst the former never does. Scrofula is rarely influenced by change of climate, on the contrary Goitre is often cured by it. Goitrous tumours are less painful.

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scrofulous tumours suppurate more frequently than Goitrous. The two diseases appear to be confined to different countries, for in Scotland scrofula is a very common complaint, but Bronchocele is rarely met with. The reverse of this, is to be seen in Switzerland. In some few cases Bronchocele has extended so high up the neck as to be mistaken for scrofula. Mr Burns has related a case strikingly illustrative of this fact. "Beneath the sterno-mastoid muscle says he "the enlarged gland was lobulated and clustered into small processes, precisely resembling a chain of enlarged concatenated glands. Indeed, had I alone trusted to the impressions received before dissection, I would have been led to believe that the lymphatic glands of the neck were actually swelled, and besides that several of the conglobate glands placed behind the sterno-mastoid muscle between it and the trapezius were also affected, for into that space processes from the left lobe of the thyroid gland extended." From the

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appearances presented on post-mortem examinations. Nosologists have arranged the disease into several species such as the sarcomatous or sanguineous, the encephaloid, serous or watery Bronchocele &c. But Dr Gibson objects to these distinctions and regards the different appearances as modified forms of the original complaint. Another species has been denominated Bronchocele ventosa but this being produced by the reception of air into the parenchymatous structure of the gland or adjacent cellular membrane cannot be considered as a true form of the disease. The gland has in some instances been converted into a bony mass and not unfrequently portions of calcareous and cartilaginous matter have been found in its internal structure. Bronchocele sometimes takes on the suppurative process and after discharging immense quantities of pus, entirely disappears leaving the patient perfectly cured. Many and numerous are the instances related by authors of this Magazine. Bonetus &c.

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kind. But on the contrary suppuration has destroyed certain portions of the larynx and trachea and the patient has lost his life by suffocation. "On a trouvé" says Portal "dans des sujets qui étaient morts de suffocation, les cartilages thyroides, cricoides et les anneaux cartilagineux de la trachée artère, rongés par la carie, a la suite d'un abcess dans la thyroide." Vasalva, Morgagni & Lieutaud ont cités des pareils exemples dans leurs ouvrages". Tubercular phthisis has been produced by this disease the tumour from its pressure on the thorax obstructing the respiration. This however is of rare occurrence.

In the treatment of this disease no remedy has ever proved so beneficial or efficacious as a change of climate; but as this is not within the power of every individual, various other remedies have been resorted to, both medicinal & surgical. That medicines do and have often proved

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unsuccessful is not to be wondered at; since the cause remaining the effects must consequently be difficult of relief. Among the most celebrated remedies for this disease formerly was the Spongia Usta, and in Europe it was for a long time regarded as a certain specific when exhibited internally in the form of lozenge and externally by unction. The occasional admeinistration of calomel was supposed greatly to increase the virtues of the "burnt sponge. Fractions were also used over the tumour, applications of cold water, or the liquor ammonia acetatis, camphor &c. Among the brilliant discoveries in Chymistry, Iodine was found to be the active agent of the burnt sponge and since that time it has been substituted for it with the happiest results. The celebrated M. Coindet who has lately published an essay on the values of Iodine speaks of it in the treatment of this

disease with the highest encomiums. Of all the different formula he prefers the iodinated hydriodate of potassa. This is prepared by dissolving thirty six grains of the hydriodate and ten of iodine, in one ounce of distilled water. From six to ten drops in half a glass of water sweetened, is given three times a day, the dose being increased or diminished pro re nata. This is to be continued until it produces its effects on the system which Dr Corrigan calls iodic symptoms. Such as accelerated pulse, palpitation, frequent dry cough, loss of sleep, rapid emaciation and debility, swelling or trembling of the lower extremities. The breasts are sometimes sensibly diminished and the tumour either disappears or becomes painfully hard. When any of these symptoms appear, which evince its effects on the system, the iodine is to be discontinued, and milk, warm baths, valerian, hyo. carbonate of ammonia and other antispasmodics are to be exhibited. To the painful

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tumour leeches and warm fomentations are to be applied. The tincture is another form in which Iodine has been used but not with the same success as the hydriodate. Ring's lozenges were once very celebrated, but Dr Gibson states that he has frequently tried them without any very decided effect. The long continued use of the sulphate of potash has in some instances entirely relieved the disease. Hence we may infer that the happy combination of these two remedies viz Potash & Iodine, under the form of hydriodate is without doubt the most efficacious formula in use. For the use of Cicuta in Bronchocele we are indebted to Professor Gibson who first introduced it into practice. In the early stages "he says" it rarely ever fails in producing entire cures. That it acts like a charm in removing the morbid mass, without inducing those terrible and alarming symptoms peculiar to Iodine. From this cause

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it certainly merits the trouble. Belladonna and digitalis have likewise been recommended in Bronchocele, but they have not proved so efficacious as some other remedies and their use has been abandoned. The disease has sometimes been removed by frequent blistering cases of this kind are related by Mr B. Bell. Dr Physick and some others have effected cures by gentle though long continued pressure. From the circumstance of spontaneous suppuration sometimes curing this disease the earlier surgeons were probably led to the use of the seton. The practice is of very ancient origin and the discoverer is unknown. The caustic was also used by the ancients; its use is mentioned by Celsus. Both of these remedies have been long since abandoned from their many fatal results. When all remedies have failed and the tumour continues to increase so as to endanger the life of the individual, the last and only resource is a

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surgical operation. Celsus was among the first to recommend extirpation and in modern times it is has been performed but unhappily with little success. Hemorrhage has generally destroyed the patient. M. Palfin relates the case of a lady who died in fifteen minutes after the operation from this cause. Desault attempted to perform the operation, but was compelled to desist from the inordinate hemorrhage and apply a ligature in which he included a portion of the gland, which ultimately destroyed the patient from excessive irritation. Dupeytren succeeded in extirpating the gland, with a very inconsiderable loss of blood, but the patient died from irritation and inflammation. Grandi a surgeon of Marseilles has succeeded in performing the operation. A remarkable case is related by Fodéré of a Parisian barber who performed the operation on his wife with perfect success. But these few successful cases are not sufficient to authorize the repetition of so hazardous

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an operation. Dr Gibson whose professional skill is equalled by few and surpassed by none is opposed to this operation, from the conviction that although the patient may not die of hemorrhage; he can scarcely ever survive the violent constitutional symptoms which supervene. Dismayed by the many fatal results from extirpation, Mr Blizard an English physician was induced to try a new mode of operation; viz that of tying up the thyroid arteries and thereby destroy the medium of nourishment. In his first experiment the wound was unfortunately attacked with hospital gangrene and the patient died of secondary hemorrhage. But his theory was founded upon too correct principles to pass unnoticed by other surgeons. In 1818 Professor Matthias of the University of Landshut performed a similar operation on a man twenty four years of age who had a Bronchocele of immense size, which gave him almost insupportable pain. He first-

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passed a ligature around the left thyroid artery and in two weeks after the operation the tumour had so much diminished in size, that he was induced to perform a similar operation upon the right. The patient suffered little or no inconvenience from the operation, and a perfect cure was the result of it.

Thus it is when medicine can no longer administer the balm to suffering humanity that surgery interposes its divine aid and rescues the devoted victim from an untimely grave.

Finis

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